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G11B 33/08

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G5R RB15

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(71) Applicant(s)
PTI Limited
(Incorporated in the United Kingdom)
Units 5/6 Station Road, Guisley, LEEDS, LS20 8BX, United Kingdom

(72) Inventor(s)
Andrew Fieldhouse

(74) Agent and/or Address for Service
Bailey, Walsh & Co
5 York Place, LEEDS, LS1 2SD, United Kingdom

(54) Abstract Title
Data cartridge assembly with vibration damping

(57) A cartridge 16 for containing a data device 48 which is prone to vibration during activity and which may in one embodiment be held in a container 52. The cartridge is provided with guide means for locating the data device or the container therein. In addition, the cartridge is provided with connection means 38 in communication with the device for connection of the device to corresponding connection means within other apparatus such as a computer. The cartridge is provided with damping means 74, 76, 76, 80 to damp the vibrations and/or the connection means is permitted to move relative to either or both of the cartridge and the device, thereby eradicating the deleterious effect on the electrical connection which can be caused by vibration of the data device.

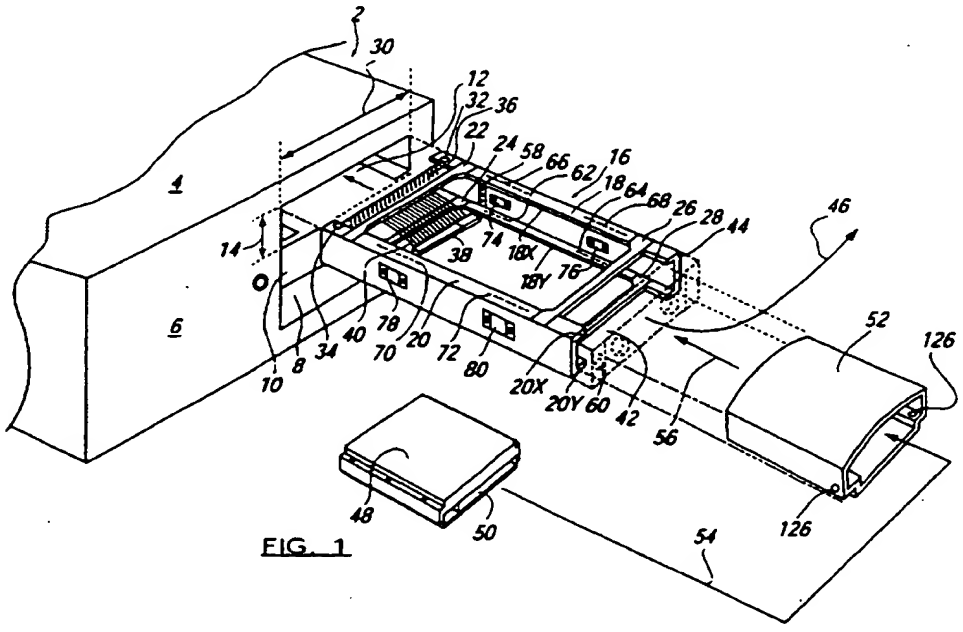
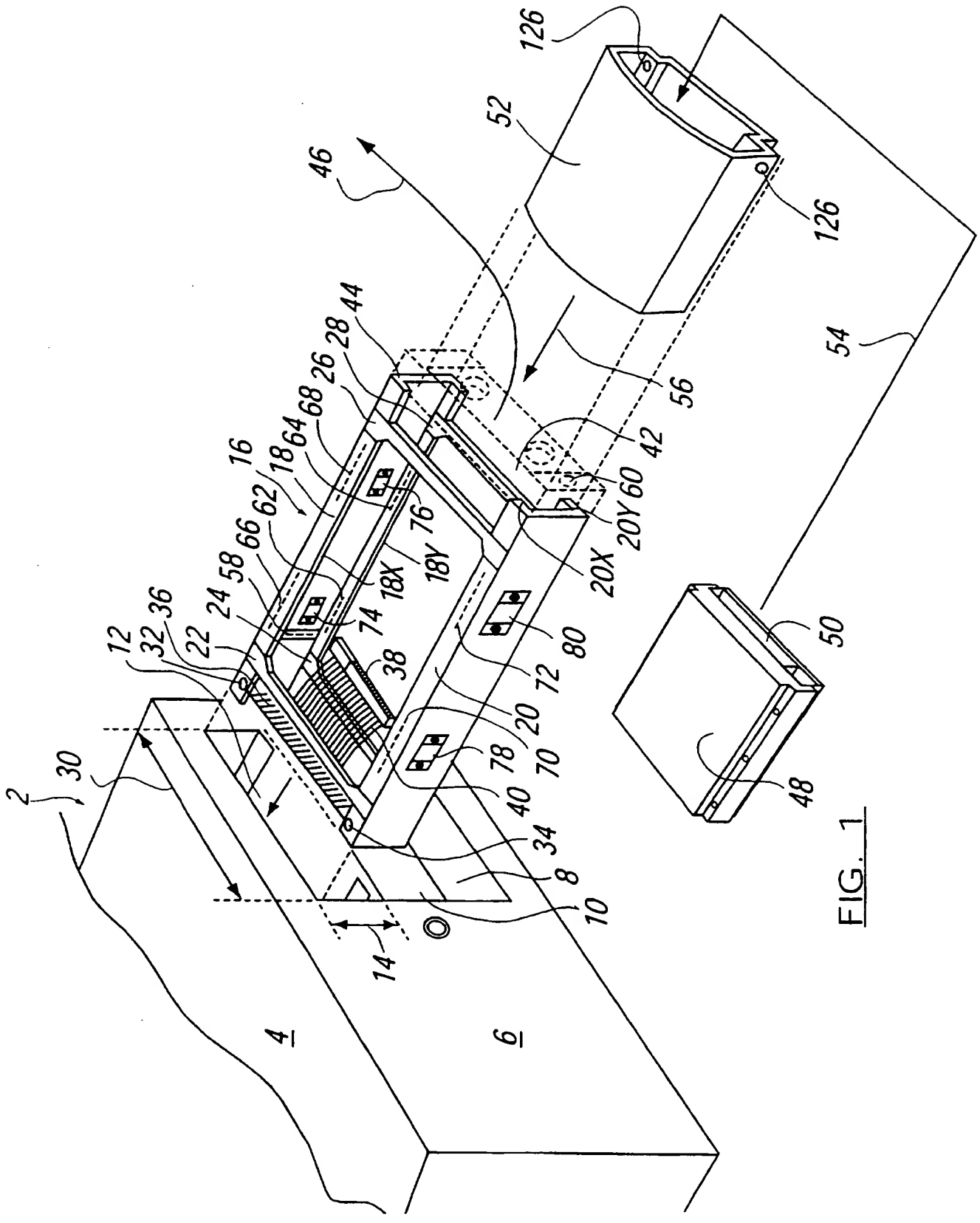


FIG. 1

GB 2 342 759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18X
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FIG. 1

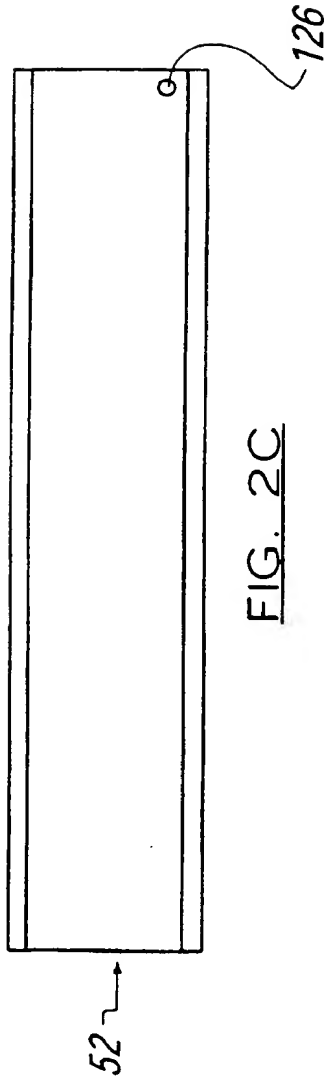

FIG. 2C

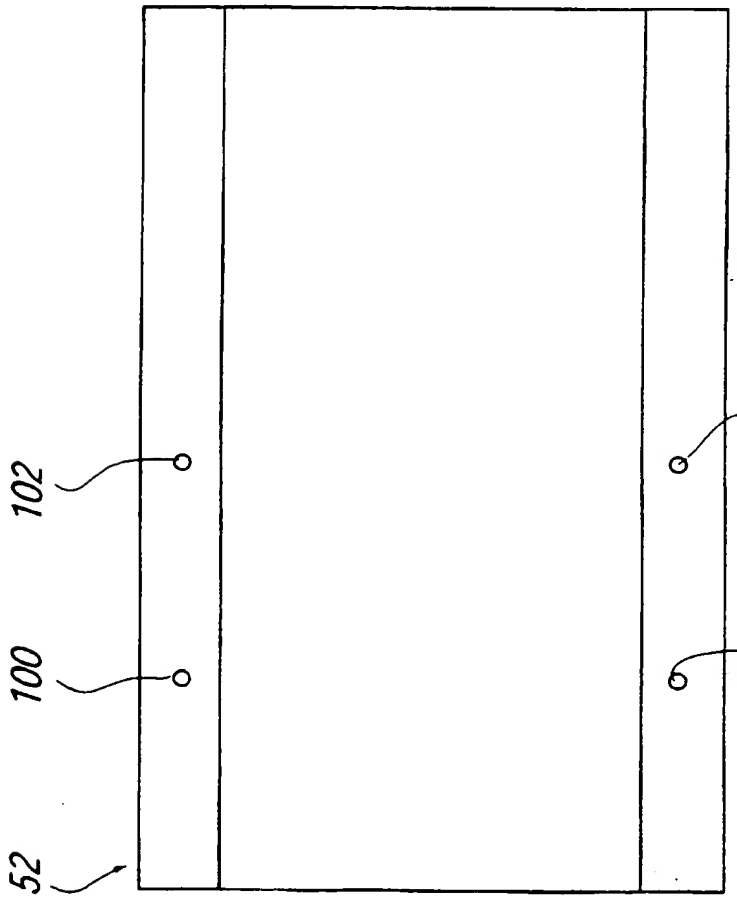

FIG. 2A

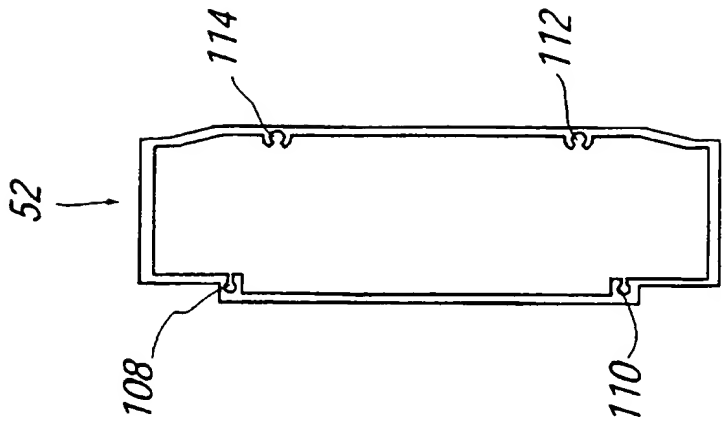

FIG. 2B

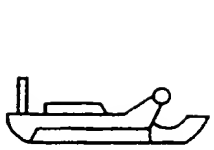

FIG. 3C

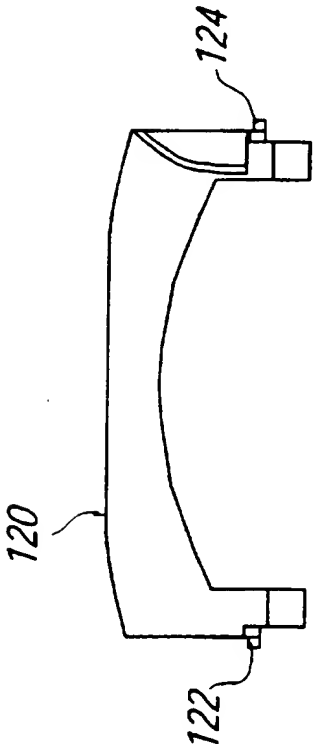

FIG. 3A

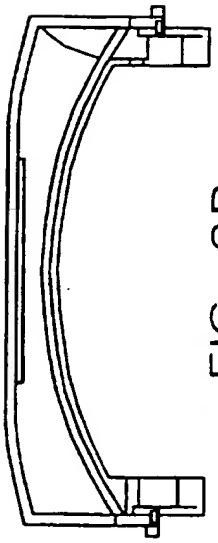

FIG. 3B

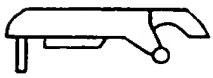

FIG. 3D

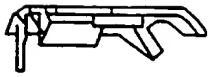

FIG. 3E

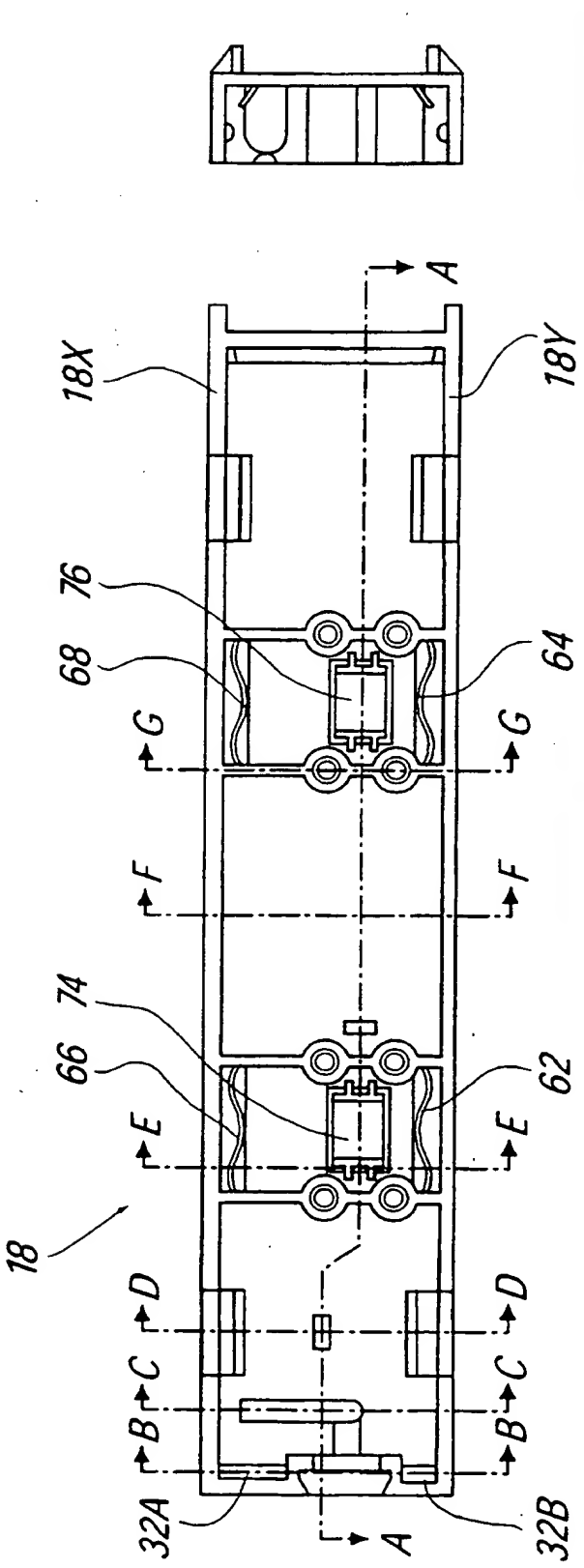

FIG. 4B

FIG. 4A

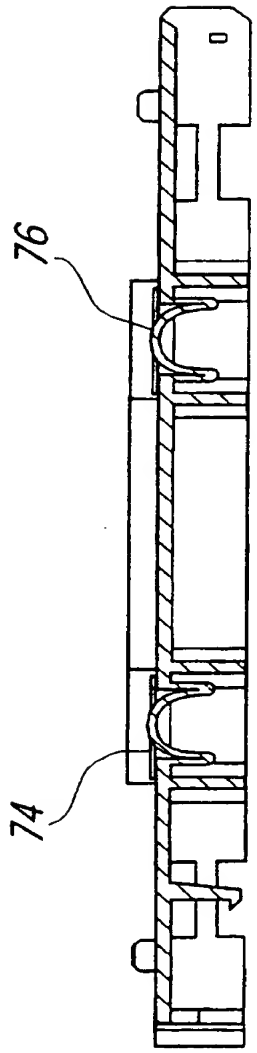

FIG. 5A

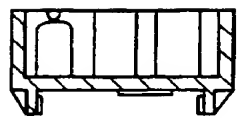

FIG. 5G

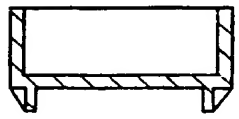

FIG. 5F

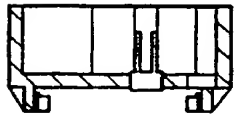

FIG. 5E

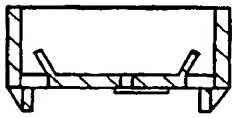

FIG. 5D

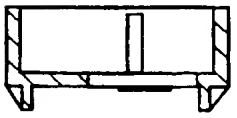

FIG. 5C

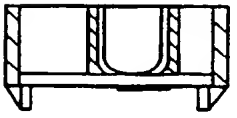

FIG. 5B

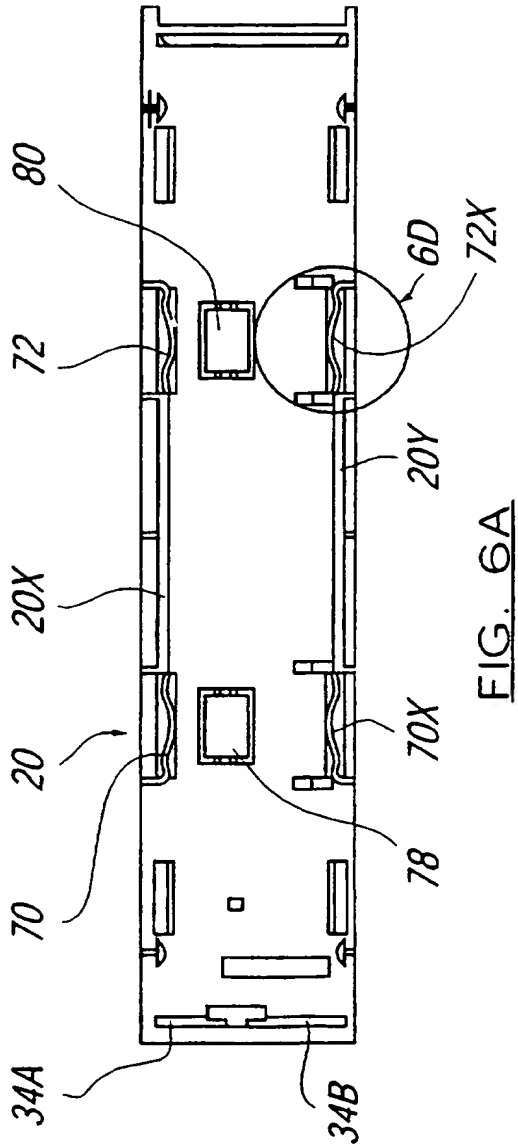

FIG. 6A

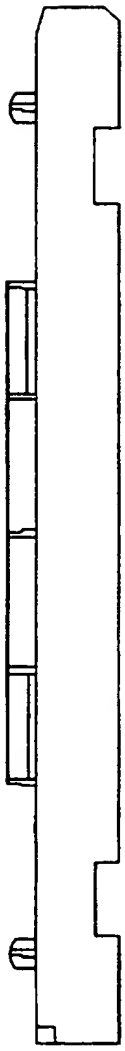

FIG. 6B

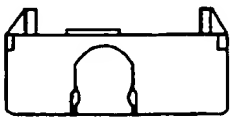

FIG. 6C

FIG. 6D

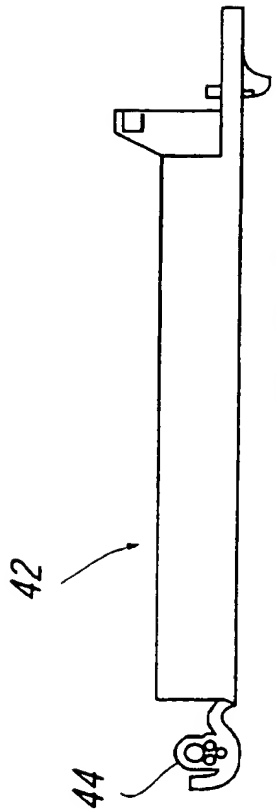

FIG. 7A

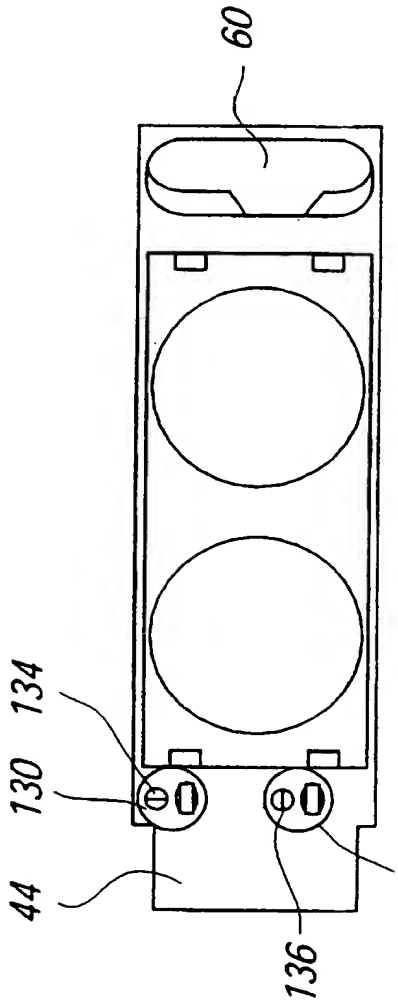

FIG. 7B

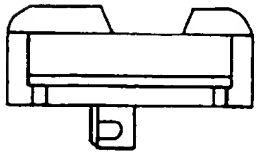

FIG. 7C

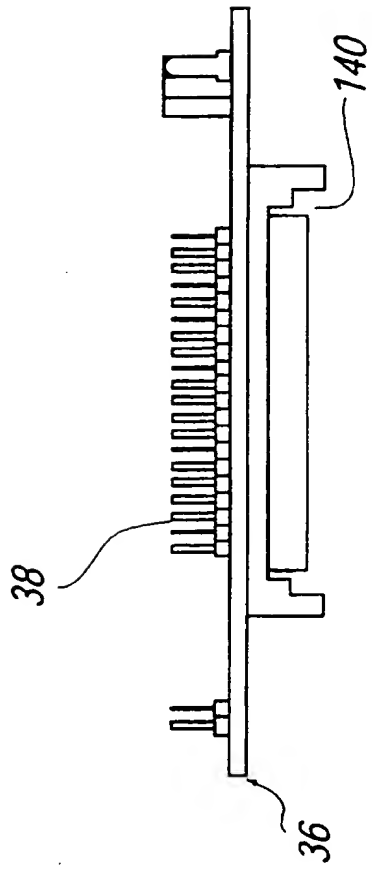

FIG. 8A

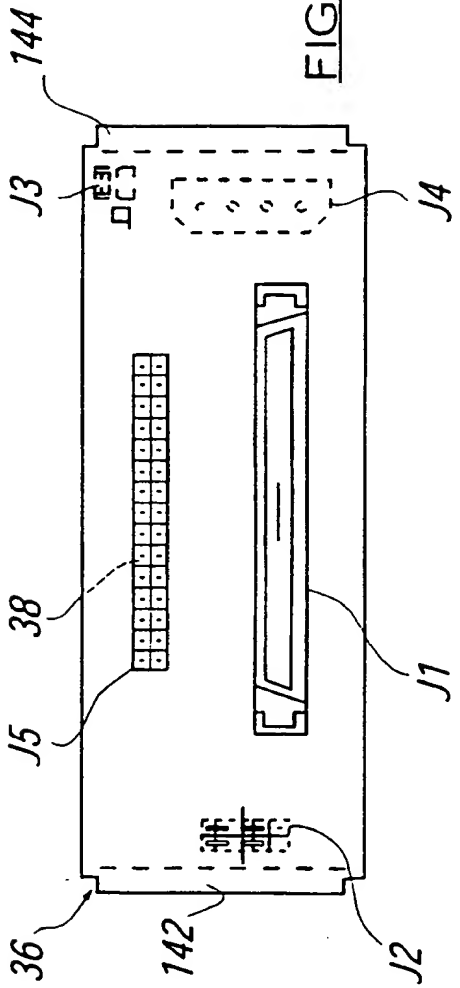

FIG. 8B

CIRCUIT DETAILS		
PIN NO.	FUNCTION	CONNECTS TO PIN
J1	EARTH FOR FAN	J2 10
J2	EARTH FOR FAN	J3 16
J3	EARTH FOR POWER LED	L1 12
J4	+VE FOR POWER LED	L1 13
J5	+12V FOR FAN	J2 11
J6	+12V FOR FAN	J3 17
J7	+VE TO BI COLOUR LED FOR YELLOW (ACTIVITY)	L2 15
J8	+VE TO BI COLOUR LED FOR RED (DELAY)	L2 14
J9	N/C	
J10	N/C	

FIG. 9A

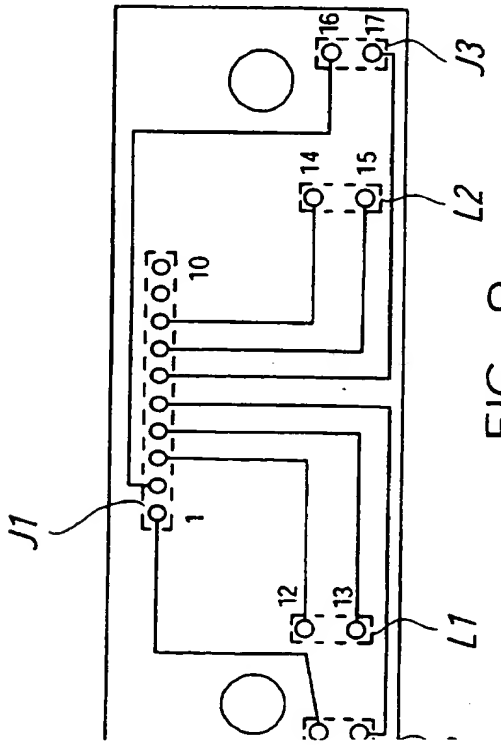

FIG. 9

Computer Cartridge Assembly

This invention relates to a removable computer cartridge assembly for housing computer peripheral data devices which have a tendency to vibrate during activity. There are many such devices currently available including CD-ROM drives, floppy disk drives, Hard Disk Drives, so-called ZIP® and JAZ® drives, and the like.

The following description will however relate exclusively to the provision of a cartridge assembly for housing a hard disk drive, and it is to be assumed that the skilled addressee will appreciate the wider application of the invention.

Hard Disk Drives (HDDs) are a common component of modern personal computers, and although not absolutely essential to the operation of the computer, almost every computer available is currently provided with at least one HDD storage component. Such components are usually secured to an internal chassis of the computer with screws and are not openly accessible without first removing at least a portion of the external casing of the computer.

HDDs manufacturers are in intense competition with one another to win orders for their drives with computer manufacturers who will install a particular HDD component in many thousands of computers. Furthermore, there have arisen in the computer industry a number of standard specifications to which HDDs must be constructed to allow

i. ease of installation in and removal from the computers of a number of different manufacturers,

ii. the transfer of data stored on the cylinders of the HDD through its heads and ultimately to another component within the computer, such as its RAM or processor and the electronic control circuitry which operates the said drive heads, and

iii. the provision of power to the HDD component from the primary power source of the computer.

The above design considerations have manifested themselves in
i. a plurality of spaced apertures at predetermined positions on the edges of the drive through which screws may pass to allow for the attachment of a HDD within a drive bay slot provided in the internal chassis of the computer,
ii. a particular type of interface connector provided at one end of the HDD to which a corresponding interface connector may be attached to allow data transfer from the HDD to the motherboard of the computer or other component-a plurality of such internal connectors are commonly provided on a single or multiple ribbon cables within the computer to effect data transfer between a plurality of different devices and the motherboard of said computer, and finally
iii. a standard 4-pin 5 and 12 Volt DC power connector.

It is to be noted that some HDDs are provided with a single connector which both provides power to the drive and can effect data transfer.

The most common current interface connectors are based on either the IDE standard (Integrated Drive Electronics) or SCSI standard (Small Computer Systems Interface), and the vast majority of personal computers currently sold are provided either with a SCSI card connected to the motherboard, said SCSI card having attached thereto a SCSI cable to allow for the connection of other SCSI devices, and/or are provided with a ribbon cable connected to directly the motherboard, the said ribbon cable being provided with a number of connectors therealong to which IDE devices can be connected.

In both circumstances described above, the installation of a new SCSI or IDE device within a computer involves opening of the external casing of the machine and physically connecting either the SCSI cable or the ribbon cable (and optionally the power cable) to the device.

To simplify the installation and connection of peripheral devices there has been developed a particular type of connector known as the Single Connector Architecture (SCA) which is a "sidewipe" connector. There are two parts to the connector, the first provided on the component being installed which is typically a rectangular protrusion, the upper and lower longest surfaces of which are provided with a plurality of contacts (commonly 40 on each surface), and the second having a recess of corresponding shape to that of the said protrusion and being provided with corresponding contacts therein which receives the protrusion and in doing so automatically brings respective contacts together. The second part of the connector is ideally provided internally of the computer and in a location behind the numerous drive bays commonly provided by manufacturers at the front or elsewhere on their machines such that the device can be inserted into one of said bays and on complete insertion, the connection between the device and the computer is made.

It should be noted that the internal chassis of the computer is commonly of a configuration to allow sliding insertion and extraction of peripheral devices such as CD-ROM drives and the like, and a further standard such as those mentioned above has evolved in relation to the width (5.25") and depth of both the device and the chassis in which it is located. It is common to provide behind such a chassis a printed circuit board provided with connectors to allow devices to be "plugged" into the computer wherein the electrical connection between the computer and the

device is automatically made as the device is inserted, the alignment of respective connectors of device and computer being effected by the chassis within which the device may slide.

Such SCA connectors are widely available and in widespread use on powerful computers such as servers and high-end workstations where so-called "hot-swap" or "hot-plug" (where the device can be connected to the machine without requiring to switch off the machine) capabilities are a requirement, but their use has heretofore not been widely considered for the personal and home computer market on account of the increased cost of machines provided therewith.

With particular regard to HDDs and other devices which are prone to vibrate during data transfer activity, there are a number of disadvantages associated with their connection within a computer.

Firstly, computer storage devices in general and particularly HDDs are required to be extremely accurate in that the read/write heads of the device must be extremely precisely positioned on the drive cylinder on which the data is stored before said data can be accessed. The requirement for exact positioning of the drive head without overshoot or undershoot precludes the use of internal damping, and therefore HDDs are prone to vibrate. When it considered that the rotational speeds of the drive heads in most existing HDDs is 7200 rpm, and that recent improvements have lead to drives with rotational speeds of above 10000 rpm, it will be appreciated that the vibrational forces may be significant, and have a major influence on the performance, in particular the data seek time of the drive. Additionally, the drive data access times and data transfer integrity can be severely reduced by such vibrations as incorrect positioning or rotational movement of the heads due to vibration necessitates a second positioning or reading step be

performed. In extreme circumstances the drive becomes unusable because the heads can rarely be correctly positioned or maintain rotational stability.

A further disadvantage of such vibrations is manifested at the SCA connection. The connector facilitates easy installation and removal because it is a sidewipe connector and as such electrical connection is not made as pins are received in individual recesses provided with contacts. A single protrusion with many contacts simply "wipes" into a single recess and the various contacts are made, optionally in a particular order to provide a grounding function to the component to prevent electrical damage thereto as it is connected. The tendency for the drive to vibrate has a deleterious effect on such connectors as the contacts therein are formed of gold plated tin strips of the order of 1 mm wide. The layer of gold on said contacts is typically of the order of only a few microns thick and henceforth the frictional forces within the connector caused by vibration of the drive can erode the gold plating revealing the tin underneath which oxidises, whereupon the connection fails and data on the drive can no longer be accessed.

It is the object of this invention to provide a means of connecting a peripheral data device to a computer or like apparatus which mitigates the above disadvantages, without any loss in the simplicity with which such device may be connected.

It is a further object of the invention to provide a means of connecting a peripheral data device within a computer which both increases the longevity of both the device and the connection.

According to the invention there is provided a cartridge for containing a data device which is prone to vibration during activity and which may optionally be rigidly secured to container means,

said cartridge having guide means for locating said data device or said container within said cartridge, said cartridge further being provided with electrical connection means in communication with the device for connection of the device to corresponding connection means within a computer, characterised in that said cartridge is provided with damping means to damp said vibrations and in that the connection means is permitted to move relative to either or both of the cartridge and the device.

Preferably the device is rigidly secured within container means, and the cartridge damps the vibrations of the container means resulting from the vibrations of the device transmitted thereto.

Preferably the device and optionally the container means are releasably attached within the cartridge, and the guide means thereof aids the insertion and extraction of the said device or container means into or from the said cartridge.

The device is preferably a HDD unit.

It is yet further preferable that the width of the cartridge and its configuration enable its insertion into a standard 5.25" drive bay provided in a computer.

Preferably the electrical connection means provided on the cartridge is a printed circuit board (PCB) provided with a connector which mates with a corresponding connector within the computer, and the electrical connection of the device to said PCB allows relative movement therebetween such that said such that the device or the container means within which the device is secured may vibrate without transmitting any vibration to the connectors of the PCB and the computer.

Preferably the PCB is floatingly connected to said cartridge.

Preferably the connector on PCB is a SCA connector.

Preferably the cartridge is fabricated of a material known to possess damping qualities, such as a injection moulded plastic, and furthermore the damping is preferably substantially provided by flexible ribs integrally formed with the cartridge in both of its sides and which can flex, thus providing a flexible mounting for the device.

Preferably the cartridge comprises a locking panel behind which the device is located in the cartridge thus securing same therein.

Henceforth the vibration of the device during activity is reduced and the previously deleterious effect thereof on the electrical connection between the device and a connector rigidly secured within a computer is eradicated.

A further advantage of the invention is that the device can be easily slotted into an existing spare drive bay of a computer and connected thereto, either using rigid SCA connectors, SCSI cables, or by means of a ribbon cable and associated IDE connector , in which case the connector on the device to which connectors within the computer would be conventionally attached is prevented from being abused and mistreated by rough and inaccurate human connection. The connector provided on the PCB of the cartridge may be altered to suit different interface requirements, and furthermore said PCB can be inexpensively replaced if damaged, whereas the replacement of an entire HDD device may prove extremely costly, especially if data stored thereon cannot be retrieved.

A specific embodiment of the invention is now described by way of example only with reference to the accompanying drawings wherein:

Figure 1 shows a perspective schematic illustration of the assembly of a cartridge according to the invention;

Figures 2A, 2B, 2C show respectively a plan view, an end elevation, and a side elevation of a container within which a hard disc drive unit may be contained;

Figures 3A, 3B, 3C, 3D, 3E show varying views of the handle adapted for attachment to the container of Figure 2;

Figures 4A, 4B show respectively a side elevation, and an end elevation of a wall member from which the cartridge of Figure 1 is constructed;

Figures 5A, 5B, 5C, 5D, 5E, 5F, 5G show respectively the various sectional views identified in Figure 4A.

Figures 6A, 6B, 6C, 6D show respectively a side elevation, a plan view, an end elevation, and an enlarged portion of a second wall member from which the cartridge according to the present invention is constructed.

Figures 7A, 7B, 7C show respectively a plan view, a side elevation, and an end elevation of a door member adapted for attachment to the cartridge of the present invention;

Figures 8A, 8B show respectively a plan view, and a side elevation of a printed circuit board adapted to be floatingly held within the cartridge of the present invention;

Figure 9 provides a schematic indication of the electrical connections between components to be provided by the printed circuit board of Figures 8.

Referring firstly to Figure 1, there is shown a computer 2 provided with a casing 4 with a front portion 6 in which are provided a number of drive bays 8, 10, 12 adapted to receive peripheral data devices and the like to expand the capabilities of the computer 2. The depth 14 of one such drive bay 12 has been generally standardised within the computer manufacturing industry, and is conventionally 43.5mm. Accordingly, many peripheral data devices labelled as "internal" by their manufacturers have an almost identical depth to enable their insertion within such a drive bay 12.

The connection of such a peripheral data device 12 has heretofore conventionally required the owner of the computer to remove a portion of the casing 4 of the computer to allow access to various connectors (not shown) provided internally of the computer to be connected to the rear of the said peripheral data device.

In this embodiment of the invention, a cartridge 16 is provided and is constructed of a pair of side walls 18, 20 maintained in spaced relationship by a number of cross members 22, 24, 26, 28, the width of the said cartridge 16 being fractionally less than the width 30 of the drive bay 12. Furthermore, the depth of the wall members 18, 20 is marginally less than the depth 14 of the said drive bay facilitating easy insertion of the cartridge 16 thereinto.

Slots 32, 34 are provided at the rear of the wall members 18, 20 such that the edges of a printed circuit board 36 can be slotted therein while nevertheless allowing for some lateral movement of said PCB in the width direction of the cartridge.

Said PCB is provided on both faces with a connector, one of which can be seen in Figure 1 at 38. In the embodiment shown in figure 1, the connector 38 is attached by a ribbon cable 40 to the said PCB, but it is to be understood that the said connector 38 could be provided integrally with said PCB, or directly and rigidly attached thereto.

A swinging door member 42 is provided towards the front of the cartridge 16 and hinged at one end to wall member 18 at 44 such that it can be opened in a rotational direction shown by arrow 46.

A hard disc drive (HDD) 48, or other peripheral data device to which this invention may apply, is provided on its rear face with a recessed connector 50 adapted to receive the connector 38 and henceforth allow the connection of said HDD to said PCB 36. Such connection is effected by first locating said HDD 48 within a container 52 and securing same therein by means of screws or other suitable means. Ideally, the external contours and dimensions of the container 52 are broadly identical to the channel defined by the wall members 18, 20 of the cartridge, whereas the internal contours and dimensions of the said container allow for easy insertion and rigid securement of HDD 48 therewithin. As shown in the figure, the HDD 48 is first inserted within said container 52 with said connector 50 facing to the rear thereof as shown by arrow 54.

Once the said HDD has been rigidly secured in said container 52 and at a predetermined location along its length to allow for ease of access to and connection of connector 38 to said connector 50, container and HDD are slid within the cartridge in a direction shown by arrow 56 with the door 42 in an open condition until such sliding travel is arrested by stops provided on the internal surface of the wall members 18, 20. One such stop is shown at 58.

Once fully inserted within the cartridge, container 52 and HDD 48 secured within are retained within the cartridge by closing the door 42 and securing one edge thereof by suitable means 60 to the wall member 20. In the embodiment shown in Figure 1, it is the intention that the connection between respective connectors 38, 50 can be made by a human externally of the computer simply by urging connector 58 within connector 50. The said connection may either be effected manually after the container and HDD have been inserted within the cartridge, or in the case where the connector 38 is provided rigidly mounted on said PCB 36, the connection may be effected automatically as a result of the sliding travel of the HDD and associated container within the cartridge. In the latter case, the longitudinal positioning of the stops 58 will be such that complete connection between the said connectors 38, 50 will be effected on complete insertion of the HDD 48 and container 52 within the cartridge.

The wall members 18, 20 comprise upper and lower guide means 18X, 18Y, 20X, 20Y respectively which define a channel within the cartridge in which the container 52 is allowed to slide. Furthermore, in the lower and upper surfaces of the upper and lower guide means, there are provided flexible ribs 62, 64, 66, 68, 70, 72 which both allow the sliding motion of the container 52 within the cartridge, and also allow for slight vertical movement thereof within said cartridge. Additionally, the wall members 18, 20 forming the cartridge are provided with laterally inset flexural damping tabs 74, 76, 78, 80 which analogously to the said flexural ribs, both allow sliding motion of the container 52 within the cartridge, and allow for slight lateral movement thereof within said cartridge. The said damping tabs have a further advantageous effect in that vibration transmitted by the HDD 48 to the container 52 during activity thereof is damped, which as discussed above, can have beneficial consequences. Furthermore, in the case where the

connector 38 is rigidly attached to the PCB 36, the permitted lateral movement of the said PCB coupled with the lateral damping effect provided by the said damping tabs on the container 52 allow a substantially unstressed connection to be effected between the PCB 36 and a further connector (not shown) rigidly secured internally of the computer 2. As mentioned above, this is advantageous to the longevity of the connection between said PCB and said computer internal connector.

It is to be pointed out that Figure 1 provides only a schematic illustration of the working of the invention, and that the remaining figures and description associated therewith provide increased specificity.

Referring now to Figures 2A, 2B, 2C in which different views of the container 52 of figure 1 are shown, holes 100, 102, 104, 106 are provided in the external surface of said container through which screws can pass to secure an HDD 48 within said container. Furthermore, the internal configuration of the said container shown in Figure 2B is provided with a plurality of grooves 108, 110, 112, 114 which substantially correspond to the external contours of the HDD 48 thus enhancing the rigidity of the securing of said HDD within the container.

Figures 3 show varying views of an optional handle 120 provided with lugs 122, 124 which are received in apertures 126 in the container 52 thus allowing rotational movement of said handle 120.

Figures 4A, 4B show in greater detail the configuration of a wall member 18 from which the cartridge is constructed, and the reader's attention is particularly drawn to the upper and lower guide means 18X, 18Y, the lower and upper flexural ribs 62, 64, 66, 68 and the two portions 32A, 32B of the slot 32 shown in Figure 1.

The particular configuration of the damping tabs 74, 76 is shown in greater detail in Figure 5A, whereas Figures 5B, 5C, 5D, 5E, 5F, 5G show particular sectional views identified in Figure 4A.

Figure 6A shows a side elevation of the wall member 20 provided with upper and lower guide means 20X, 20Y, slot portions 34A 34B, flexural ribs 70, 72, 70X, 72X, and damping tabs 78, 80.

Figures 7A, 7B, 7C show different views of the door 42 shown in Figure 1, and in particular the means of connection 44 of said door to the wall member 18, and also the means 60 by which said door 42 may be secured to the alternate wall member 20 to prevent the escape of the container 52 from within the cartridge. In Figure 7B, there are shown a pair of holes 130, 132 sized to receive LED's 134, 136 with which the PCB 36 can electrically communicate in order that an indication of the drive activity and/or status can be provided to a user of the computer when the cartridge 16 containing said container and drive is fully inserted within the drive bay 12 of the said computer.

Figures 8A and 8B provide a detailed representation of the particular configuration of the PCB 36, and in the embodiment shown in these figures, it will be instantly appreciated that the connector 38 is rigidly and directly attached to said PCB. On the alternate face of said PCB there is provided a further connector 140 which is ideally an SCA connector of the type described above which facilitates connection to a corresponding SCA connector provided rigidly and internally secured within the computer 2. Edges 142, 144 of the PCB 36 are adapted to be received in the slots 32, 34 of the wall members 18, 20 such that slight lateral movement of the said PCB in the width direction of the cartridge is permitted.

With particular reference to Figure 8B the particular components provided on said PCB are as follows:-

J1 is an SCA-2 connector;
J2 is a 10-way 0.1" pitch header;
J3 is a 2-way 0.1" pitch connector with friction lock available from Molex, reference number 22042021;
J4 is a standard 4-way DC power port; and
J5 is a 40-way header for IDE I/O 10.01" pitch connection.

Figure 9 shows the various electronic connections which are to be made on the PCB to enable its correct functioning, and these connections are specifically listed in the table shown in Figure 9A.

A further aspect of this invention is the provision of electrical contact means within the door 42 and in communication with the PCB such that on detection of broken contact means by the PCB, electrical power is automatically removed from the HDD 48 and accordingly allows for safe removal thereof from within the cartridge. Additionally, the LEDs 134, 136 may illuminate differently when the door is in an open condition and said contact means are broken from the circumstances where the door is in a closed condition and contact is made.

Furthermore, the said LEDs 134, 136 may be single colour or bi-colour LEDs and their illumination is controlled by the PCB 36 to provide indication of the power supplied to the HDD, its current status and activity.

It is preferable that the PCB 36 is provided in two pre-defined formats, namely low voltage differential (LVD) or single ended SCSI interface, or IDE interface versions.

In the circumstances where the cartridge 16 is to house an IDE data device, it is preferable that a second PCB (not shown) is attached both to the container 52 and between the first PCB 36 and the HDD 48. This facilitates the simple disconnection of the HDD 48 and associated container 52 from within the cartridge without requiring interference with the connection between the first PCB and a cable and associated connector provided internally of the computer 2. More particularly, the said first PCB is ideally provided on its side facing the internal computer connector with a standard 40 pin male connector for the computer internal IDE data connector, and a standard 4 pin power connector.

The alternate side of this first PCB is preferably provided with a standard 80 pin SCA connector to mate with a corresponding SCA connector provided on the second PCB within the cartridge. On the side of the second PCB which is most closely disposed to the connector 50 of the HDD 48 there is provided a flying lead with a 40 pin connector for data transfer from and to the said HDD, and a flying lead with a 4 pin power connector which provides power to said HDD.

Although this particular configuration is not shown in the diagrams, from the above it will be eminently clear to those skilled in the art what is intended by the Applicant. The particular configuration described enables simple removal of the HDD 48 and associated container 52 from within the cartridge 16, the second PCB mentioned above remaining connected to said container and said HDD as these components are removed. In this configuration, it is the connection between the respective PCB's which is de-stressed by means of allowing the first PCB to move laterally in the width direction of the cartridge, and also by providing a damping effect on

the container 52 to which vibrations are transmitted by the HDD 48 during activity.

Claims :-

1. A cartridge for containing a data device and/or container which is/are prone to vibration during activity, said cartridge including guide means for locating said data device and/or container within said cartridge, said cartridge further including connection means to allow connection of the data device with other apparatus and wherein said cartridge is provided with damping means to damp the effect of said vibrations.

2. A cartridge according to claim 1 wherein the connection means is permitted to move relative to any of or any combination of the cartridge and the data device or container.

3. A cartridge according to claim 1 wherein the data device is rigidly secured within the container, and the cartridge damps the vibrations of the container resulting from the vibrations of the device transmitted thereto.

4. A cartridge according to any preceding claim wherein the device and/or the container are releasably attached within the cartridge.

5. A cartridge according to any preceding claim wherein the guide means of the cartridge aid the extraction and insertion of the device or container into and from the said cartridge.

6. A cartridge according to any preceding claim wherein the data device is a HDD unit.

7. A cartridge according to any preceding claim wherein the width of the cartridge and its configuration enable its insertion into a standard 5.25" drive bay provided in a computer.

8. A cartridge according to claim 1 wherein the connection means provided on the cartridge is a printed circuit board (PCB) which allows electrical and/or data connection with other apparatus.

9. A cartridge according to claim 8 wherein the connector means is provided with a connector which mates with a corresponding connector within the other apparatus, and the electrical connection of the data device to the connector means allows relative movement therebetween such that the data device or the container within which the data device is secured may vibrate without transmitting any vibrations to the connectors and other apparatus.

10. A cartridge according to any preceding claim wherein the connector means is floatingly connected to the cartridge.

11. A cartridge according to any preceding claim wherein the connector on the PCB is a SCA connector.

12. A cartridge according to any preceding claim wherein the cartridge is fabricated from a material possessing damping qualities.

13. A cartridge according to any claim 12 wherein the cartridge is fabricated from solidified resin.

14. A cartridge according to any preceding claim wherein a flexible mounting is provided in the cartridge for the data device and/or container to aid the damping effect.

15. A cartridge according to claim 14 wherein the flexible mounting includes flexible ribs.

16. A cartridge according to any preceding claim wherein a locking panel is provided behind which the data device and/or container is located in the cartridge.

17. A cartridge according to claim 16 wherein the locking panel is provided as a door hinged to the cartridge.

18 A cartridge for containing a data device and/or container which is/are prone to vibration during activity, said cartridge including guide means for locating said data device and/or container within said cartridge, said cartridge further including connection means to allow connection of the data device with other apparatus and wherein said connection means is permitted to move relative to either or both of the cartridge and the data device or container.

19 A cartridge for containing a data device or a data device held in a container, which data device is prone to vibration during operation, said cartridge having means for mounting the data device and/or container within said cartridge, said cartridge further provided with connection means to allow the data device to be connected to other apparatus and wherein said cartridge is provided with damping means to damp the effect of the vibrations and said connection means is permitted to move relative to either or both of the cartridge and the data device or container.

20 A cartridge as hereinbefore described with reference to the accompanying drawings.